

## Economic sustainability analysis of the specialty coffee farmers in Garça/SP

Amanda dos Santos Negreti Campos<sup>1</sup> , Eduardo Guilherme Satolo<sup>2</sup> ,  
Priscilla Ayleen Bustos Mac-Lean<sup>3</sup> , Sérgio Silva Braga Júnior<sup>2</sup> 

<sup>1</sup>União Cultural do Estado de São Paulo/UCESP, Departamento de Gestão, Araçatuba, SP, Brasil

<sup>2</sup>Universidade Estadual Paulista/UNESP, Departamento de Gestão, Desenvolvimento e Tecnologia, Tupã, SP, Brasil

<sup>3</sup>Universidade Estadual Paulista/UNESP, Departamento de Engenharia de Biosistemas, Tupã, SP, Brasil

Corresponding author: amandanegreti.unesp@gmail.com; eduardo.satolo@unesp.br; priscilla.mac-lean@unesp.br; sergio.braga@unesp.br

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### ABSTRACT

In the face of new market opportunities, farmers can increase the value of the product. This is in Short Food Supply Chains (SFSCs) based on the value of origin and tradition. Farmers use this valuation as a product differentiation that improves their economic Sustainability. Therefore, this work aims to analyze the economic Sustainability of specialty coffee farmers in Garça, São Paulo State (Brazil), after participating in SFSCs. For this reason, the research approach was qualitative and quantitative, with the study of several cases and the application of the semi-structured form with farmers. Data analysis, descriptive statistics, and Wilcoxon Rank-Sum Test were used. The results indicated the introduction of farmers in new markets, various distribution forms, and the addition of product varieties and premium prices, which contributed to profitability. Infrastructure costs, however, were expensive. One of the contributions of this study is to describe the specialty coffee supply chain when it is sold directly for consumption, shifting from the traditional coffee market to short chains, contributing to the literature, and the farmers in a country with limited financial resources addressing an improvement of income.

**Key words:** Direct sales; Alternative food networks; Territory; Direct farm marketing; Economic local.

### 1 INTRODUCTION

Coffee has received attention from farmers and consumers in terms of improving quality attributes associated with drinking and sustainable issues, traditions, and origins (Costa, 2020; Marescotti; Belletti, 2016). Brazil is the world's largest coffee producer, producing an average of 50 million bags (60 kg of coffee) per year between 2014 and 2019, followed by Vietnam (28 million bags per year) and Colombia (14 million bags per year) (International Coffee Organization - ICO, 2020). The main Brazilian states contributing to high productivity in processed coffee bags are Minas Gerais (54.3%), Espírito Santo (22.1%), and São Paulo (10%) (Companhia Nacional de Abastecimento - CONAB, 2020).

However, according to data from the International Coffee Organization, 2020, even if the coffee sector contributes economically to producing countries, it is necessary to recognize the importance of meeting sustainable development and poverty reduction goals to benefit developing countries and coffee farmers, related to the economic Sustainability of the coffee producer's. In this study, the economic Sustainability is associated with the factors that increase farm incomes in short chains through various reasons, such as focusing on product quality (through information about the products origin, traditional knowledge, terroir, consciousness regarding producers and their families), allowing consumers to pay the premium price (Bui et al., 2021; Kneafsey et al., 2013; Vitterso et al, 2019). As well as the increase in local sales, demanding

various local and multifunctional services, as strategies for diversification and adding value (such as properties that previously sold milk and with the insertion in SFSCs, began to diversify their production, with the sale of cheeses and other milk products with distinct characteristics) (Ilbery; Maye, 2005; Kneafsey et al, 2013; Sellitto; Vial; Viegas, 2018). Besides the generation of employment opportunities, directly, in the production and sales of agricultural products, or indirectly, by demanding different types of inputs from their suppliers (from natural additives to packaging) and by providing cross-sector services, such as tourism, promoting local brands, recreational shopping opportunities, among others, generating local development (Kneafsey et al, 2013). The value-added captures can also benefit small-scale farmers without the power to access large-scale food chains, allowing the resilience power of producers (Gorton; Salvioni; Hubbard, 2014; Kneafsey et al, 2013; Vitterso et al., 2019).

Thus, the high demand for specialty coffees and product differentiation contributes to the growth of a high-value market, in which consumption initiatives have been more ethical and based on sustainable aspects (International Coffee Organization, 2020; Marescotti; Belletti, 2016).

In this sense, the inclusion of farmers in local food chains, better known in the literature as the Short Food Supply Chain (SFSC), is one of the ways to add value to products and services by presenting ethical and sustainable aspects so that consumers can recognize that such characteristics (Arfini; Mancini, 2018; Ilbery; Maye, 2005; Renting; Marsden;

Banks, 2003). Farmers working in SFSC are reconnected to consumers, building social relationships, valuing the product's origin and the production method (Sage, 2003; Sellitto; Vial; Viegas, 2018). In this context, some quality aspects of specialty coffees are related to origin, territoriality, and traditions (Teles; Behrens, 2020).

Specialty coffees are considered grains that do not contain defects and impurities but rather differentiated sensory qualities. They are classified by scores presented by the Association of Specialty Coffees, and it is necessary to achieve a minimum score of 80 on a scale of 100 (Costa, 2020; Teixeira, 2020).

Between 2018 and 2019, there was a growth of 31% in the gourmet and specialty coffee market. Furthermore, while the market for traditional coffees has grown by around 2% a year, specialty coffees have an annual average of 13% (Secretary of State for Agriculture, Livestock and Supply, 2020).

For the specialty coffee market, the Arabica beans allow the consumer to enjoy a superior quality product (Instituto Agronômico - IAC, 2020). One of the Brazilian regions that provide exclusive production of this type of grain is the state of São Paulo, considered one of the traditional territories for coffee cultivation (Associação Brasileira da Indústria De Café - ABIC, 2020). The state's coffee production is found in two regions: Mogiana and the Midwest of São Paulo, including small properties that produce specialty coffees (Ministry of Agriculture, Livestock and Food Supply - MAPA, 2018).

According to (Brazil Specialty Coffee Association – BSCA, 2021), in the center-west of São Paulo, the Garça region is located, which makes it possible to produce a drink of superior quality due to the low local humidity. Producers in this region have already been awarded in the specialty coffee category.

Thus, farmers in Garça and region, when seeking to add value to the product, through the production of specialty coffees and acting in new markets, by entering SFSCs directly related with consumers, sought to understand: what were the impacts on the economic Sustainability of specialty coffee farmers in the city and region of Garça/S.P., after working in SFSCs?

There are studies in the literature on the coffee chain and Sustainability (Lemeilleur et al., 2020). Others addressed specialty coffees as a value-added product (Boaventura et al., 2018) and others on economic Sustainability and SFSC (De Pascale et al., 2017). However, it was impossible to find studies that jointly addressed specialty coffees, SFSC, and economic Sustainability.

Thus, this work aims to analyze the economic Sustainability of specialty coffee farmers in Garça, São Paulo State (Brazil), after participating in the Short Food Supply Chain (SFSC).

The specific objectives were to identify the changes in economic Sustainability that occurred after the activities of

producers in SFSC, based on the variables in SFSC studies, and compare the variables of economic Sustainability of producers (before and after) of the activities in SFSC.

For this, economic sustainability variables were used, according to studies that comprise SFSCs and economic Sustainability. This research was classified as exploratory, mixed approach, using a multiple case study, with farmers and the data analyzed using descriptive statistics and Wilcoxon Rank-Sum (W.R.S.) test.

The relevance of this study is the analysis of the economic Sustainability of farmers when they enter SFSC in the coffee chain. Also noteworthy is the scientific contribution to discussions on the coffee chain, SFSC, and economic Sustainability, demonstrating interdisciplinarity. Moreover, the farmers in a country with limited financial resources address an improvement of income.

## 2 LITERATURE REVIEW

### 2.1 Coffee's wave and the Supply Chain Management (S.C.M.) of Specialty Coffees

At the end of the XIX century, there was the beginning coffee wave after the Industrial Revolution. With urban growth and industrial products, there was too a social change resulting from economic systems, impacting changes on customer behavior, which passed to consuming more coffee. At this time, that beverage was valued only for stimulating caffeine effects, without appreciating the taste or other intangible attributes (Teixeira, 2020; Teles; Behrens, 2020).

Around the 1980 and 1990 the second wave arose, which was characterized by the introduction of high-quality coffee and commodity improvement. Since then, has surfaced long supply chain of coffee's sales, as Starbucks cafeterias, Juan Valdez (from Colombia), Costa Coffee (from England), Coffee Fran's (from Brazil), among others (Teixeira, 2020). This new cafeteria concept has demanded a good sectioned bean, a toast more carefully, involving process and preparing to create consumer's experience more pleasing (Teles; Behrens, 2020).

In the middle of 2000, it started the third coffee wave due to farmers' improved knowledge about the beverage's quality during the second wave. At the same time, there was the customer's demand, looking for product differentiation (Boaventura et al., 2018; Teles; Behrens, 2020). According to Teixeira (2020), the specificity of beans has valued by the customers, among other attributes, in taste, considering the origin, traditions, and control environments, following rigors patterns of quality, from raw coffee preparation, roasting, and packaging, with such information on the package.

To ABIC (2020), Costa (2020), and Teixeira (2020), the specialty coffees that originated during the third wave are

the beans that do not present defects and impurities but have differentiated sensorial attributes.

Specialty coffees are classified through scores presented by the Specialty Coffee Association, which involve the analysis of experts on some criteria, including aroma, flavor, aftertaste, acidity, uniformity, balance, clean cup, and sweetness (Teixeira, 2020).

In this sense, to add value to the benefit and service offered to the consumer, with special coffee and related services that involve the experience of its consumption, business processes throughout the supply chain must be well integrated (Lambert; Stock; Vantine, 1998).

Among some definitions of Supply Chain (S.C.), Ballou, Gilbert and Mukherjee (2000) cite all activities associated with the transformation of goods and services and the flow of information to supply raw materials to the final consumer. Mentzer et al. (2001) also define it in the same sense, being a team of three or more entities, including organizations and other individuals, directly involved in a flow (from opposite directions), involving goods, services, and information for customer service. Specialty coffee (S.C.) involves activities to supply raw materials to the final consumer, incorporating a team of three or more entities, in which most cases involve: the property that produces; processing unit; intermediate buyers; roasters; service providers (including cafeteria and/or retail) and finally, final consumption (Costa, 2020). Thus, transformation steps are involved throughout the chain, containing information flows and financial aspects, to meet final consumption, as shown in Figure 1.

The generation of value in coffee involves aspects that are integrated throughout the chain, based on information from the rural producer, making it possible to add value to the

product, including traceability aspects, like certifications with information about the production's mode, origin, and quality of the drink for a specialty coffee (Belletti; Marescotti, 2016; Teixeira, 2020). As well as information about soil quality, terroir, altitude, selected grain variety, and post-harvest process (Carvalho; Paiva; Vieira, 2016).

For Arfini and Mancini (2018), the valuation of attributes of origin and manufacturing process is part of the specific characteristics of actors who work in the Short Food Supply Chain (SFSC), as there is value generation along the channel, creating value to producers and the territory where it operates, so that the final consumers identify these characteristics.

## 2.2 Short Food Supply Chain (SFSC) and Sustainability

To Kneafsey et al. (2013), SFSCs was developed by Marsden, Banks and Bristow (2000), and its concept allows the re-spatialization of food, and it is not about the distance over which a product is transported, or the number of times is handled, but the fact that products to arrive at the consumer with information.

In this sense, the SFSCs are constituted by the proximity between producer and consumer (as sales face-to-face or online sales, where consumers buy directly from the producer), promoting personal interaction and trust. The spatial proximity in which local producers are valued. The extended space shows an increase in cultural, traditional, and social proximity between producer and consumer (with the appreciation of more sustainable, productive modes and product origin) (Ilbery; Maya, 2005; Kneafsey et al., 2013; Sellitto; Vial; Viegas, 2018).

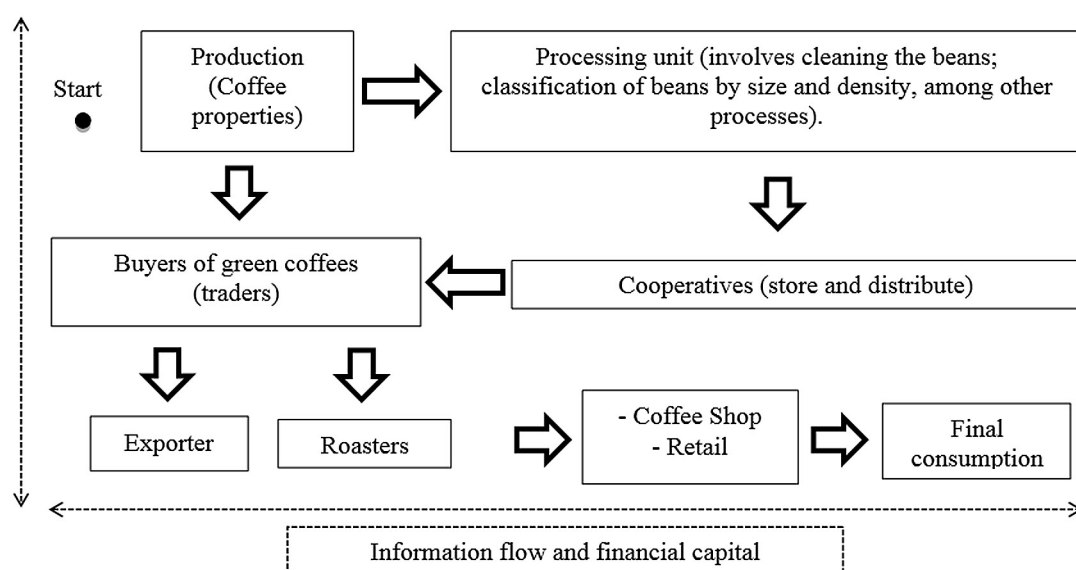


**Figure 1:** This figure illustrates the Supply Chain Management of Special Coffee.

Source: Adapted from Costa (2020).

Because consumers of specialty coffees value traditional characteristics, including a superior final beverage in its artisanal and traditional aspect, as well as concerns about its sustainable production methods, there is an increase in coffee producers seeking these differences to add value to the product (Boaventura et al., 2018; Marescotti; Belletti, 2016). From this perspective, several strategies highlight these products and their origins, including domain names, brands with different meanings, and geographical indications, searching for a closer relationship with the final consumer (Boaventura et al., 2018).

The search for an approximation with consumption differs from the conventional coffee chain, as most small producers sell the beans to intermediaries who know the quality and origin of the product. For example, the roaster makes the blend with different beans of different qualities for the composition of the final coffee. Thus, producers may not reach a high value because knowledge about their origin and production is not always generated (Boaventura et al., 2018).

Sellitto, Vial and Viegas (2018) also express the work in SFSCs aims at responsible production and consumption based on three pillars of Sustainability: environmental, social, and economic.

Aspects related to the environmental pillar relate to production methods without compromising nature. As local initiatives are, transport and CO<sup>2</sup> gases, packaging, and energy are reduced, reducing costs and contributing to the economic aspect (Malak-Rawlikowska et al., 2019; Vitterso et al., 2019). The social pillar covers aspects based on coexistence bonds (between rural and urban), trust, origin identity, cooperation between producers and local farmers (Galli; Brunori, 2013; Sellitto; Vial; Viegas, 2018). Finally, the economic pillar, in which the final price value can be considered a premium for the quality of the product offered, allows farmers to receive a more significant share of profits (Jarzębowski; Bourlakis; Bezat- Jarzębowska, 2020; Sage, 2003). The SFSC enables employment in the region in synergies with other sectors, such as tourism and the increase in product varieties, enabling new regional jobs and reducing rural exodus (Galli; Brunori, 2013; Jarzębowski; Bourlakis; Bezat- Jarzębowska, 2020).

The SFSC also allows for cooperation between farmers, including the common use of resources, processing facilities, transport, and knowledge, aimed at innovative solutions and cost reduction through various forces and capital between actors (Galli; Brunori, 2013; Sellitto; Vial; Viegas, 2018).

### 3 MATERIAL AND METHODS

As materials and methods, the present study utilized exploratory research, a qualitative approach, and a multiple case study (selection of five cases, inserted in SFSCs, with sales of specialty coffee, located in city and region of Garça/S.P., in São Paulo state). The application of materials and methods

was utilized in this research through the semi-structured form, with questions about the economic Sustainability of farmers, in the context of SFSCs, and the data analysis was descriptive statistics and the W.R.S. test.

The present study used exploratory research to familiarize the researchers with the phenomenon to be investigated, namely the economic Sustainability of specialty coffee farmers after their inclusion in SFSCs (Theodorson; Theodorson, 1970).

Exploratory research also enables knowledge that presents qualitative factors in research information (Theodorson; Theodorson, 1970).

Therefore, a qualitative approach was used for this study to broaden the understanding of economic aspects of coffee farmers after working in SFSC, based on the variables exposed in studies that understood SFSC and economic Sustainability (Green; Thorogood, 2004).

In addition to the qualitative approach, the present study also used the quantitative approach, because while the first approach allows the study of phenomenology and a broader understanding of the subject, the second allows a precise analysis of the effects and causes, with the impact of economic Sustainability on the possible causes of the integration of farmers into SFSCs (Pekrun et al., 2002).

The multiple case study was used to enable researchers to investigate the contemporary phenomenon, with changes arising from economic Sustainability in the context of entering a new form of distribution and marketing channel, the SFSC (Yin, 2005). The main choice of this method is justified by the approach to the research object, in emphasizing and interpreting the context experienced by farmers concerning economic variables (Yin, 2005).

We first sought to identify the regions that produce specialty coffees through (ABIC, 2020) to select cases. This factor shows farmers that they have initiatives to differentiate their products. Among the regions of São Paulo, Garça municipality is one of the five largest coffee producers in search of appreciation for local producers, historical recognition, and the origin of coffee. For this reason, farmers, together with public and private institutions, applied for geographical indications through the National Institute of Industrial Property (INPI) (ABIC, 2020; Garça City Hall, 2020).

Thus, for this study, the researchers utilized some criteria to select farmers in the municipality of Garça. First, the actions and sales of those farmers were required to be through SFSCs. The criteria were independent of their typology of SFSCs, can be face-to-face (as in this study was founded producers who sell on the property, allowing interaction between producer and final consumers), spatial proximity (as traditional retail), or spatially extended (products with labels presenting its origin). It is essential to mention that the final consumers, in this study, are according to SFSCs approach, meaning users

end of the products and services offered and the institutional markets, like traditional retails, bakeries, restaurants, hotels, and others (Belletti; Marescotti, 2020). The second criterion was to identify farmers who were not before part of SFSCs and later began to sell through these chains, for example, farmers who previously sold only to cooperatives and consumers could not identify the origin or production method of the product and, after the insertion of farmers in SFSCs, this was possible. The third criterion is related to the quality of the coffee offered by these farmers. For Costa (2020), although specialty coffee involves several production methods, one of the techniques often adopted in order to define and classify it is the assessment made by the Specialty Coffee Association's (S.C.A.'s), which evaluates the characteristics of the beverage and assigns a score of between 80 and 100 points. Thus, the farmers who presented their respective score, with the minimum being 80, were selected for the present research. The sample constituted for this study was non-probabilistic and threw a snowball.

The snowball technique was used, which, according to Heckathorn (1997), is helpful for samples with populations that are difficult to access and that have strong privacy concerns. In this case, the author mentions the importance of having a key informant sampling, allowing information to researchers about the respondents' behaviors and whether they will be able to inform about some data pertinent to the research. Thus, although the farmers are located in the Garça region and city, their data, such as telephone numbers or e-mail, are not readily exposed yet. Besides, there are substantial privacy concerns about production modes and income-related data. Thus, the researchers got in touch with a key informant sampling, one of the members of the association of coffee producers in Garça, who passed the telephone numbers, under the authorization of the farmers, and information about who could answer the survey in the face of strong privacy concerns.

The data was collected through the use of a semi-structured form. Three of which were used in person and two in telephone contact. The researcher used the telephone because producers avoided physical contact due to the pandemic caused by Covid-19. The semi-structured form allowed researchers to restructure questions to understand the investigated better. The use of open questions allowed for a comprehensive and complex analysis of economic Sustainability as the region's economic development, while closed questions allowed precise information, including income value, profit margin, among others (Yin, 2005).

After collecting the data through the semi-structured form, the data were processed. First, there was an organization in Excel tables, separating data by cases and grouping the same data characteristic, such as information about the respondents, the properties, and data pertinent to the research objectives, with information about before and after the insertion of the farmers in SFSCs.

The data analysis used descriptive statistics and the W.R.S. test. First, the researchers classified the qualitative variables about economic Sustainability. Although some variables are considered quantitatively feasible, the researchers classified them as qualitative in understanding the interviewees' perceptions. Those variables were filled in a contingency table, indicating the presence or absence of economic sustainability factors. Therefore, descriptive statistics were used to organize better and understand the data.

For quantitative variables, the W.R.S. test was used to contrast two data samples, one referring to the first moment, the "before" performance of producers in SFSC, and the other to the "after." Therefore, it was possible to compare the economic sustainability differences between these two moments (Yuan et al., 2006).

The use of the W.R.S. test for this research is justified, in which the data are not parametric, which allows them to be used in small samples, from an unknown population as exploratory and applied research with several case studies to test the hypothesis of changes in the economic Sustainability of rural producers after working in SFSC (Yuan et al., 2006). According to Nansikombi et al. (2020), using the W.R.S. test allows the researchers to use few data without normality. For that reason, the W.R.S. test was utilized in this study, in this way, that research presents quantitative data observed with qualitative perspectives, too, allowing in-depth studies on the cases studied.

The null hypothesis presented in this test is that there is no difference between the pairs of the studied variables (Malhotra, 2001). The established significance level was 95%, in which the null hypothesis if the p-value is less than (0.05) is rejected. Specifically, there is a difference between the pairs of the variables studied, those associated with sustainability farmers, after their inclusion in SFSCs. It is noteworthy that the statistical analysis of W.R.S. was carried out using the statistical package The R Foundation for Statistical Computing, version 3.6.1.

Both analysis, descriptive statistics, and the W.R.S. test were applied according to the economic sustainability variables present in studies that comprise SFSCs and economic Sustainability, as shown in Table 1.

## 4 RESULTS

### 4.1 Characterization of Respondents and Properties

Respondents are all male, and their positions on the property range from agricultural managers to shareholders. All have higher education courses (agricultural engineering, civil engineering, business administration, communication, and law), and two of them have postgraduate courses.

**Table 1:** Variables of economics Sustainability, according to the authors of SFSC and the form of analysis were used in the present paper.

| Variables                                                              | Authors (SFSCs and economic Sustainability)                                | Analysis form                                                                                                                  |
|------------------------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Inclusion of small producers                                           | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        | Descriptive statistics (Use of contingency table, indicating presence or absence of these variables, after insertion in SFSCs) |
| Initiatives for multiple local producers (i.e., events)                |                                                                            |                                                                                                                                |
| Knowledge shared among farmers                                         |                                                                            |                                                                                                                                |
| Profit margin increase                                                 | Enjolras and Aubert (2017)                                                 |                                                                                                                                |
| New markets                                                            | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Price’s autonomy                                                       | Vitterso et al. (2019)                                                     |                                                                                                                                |
| Increased employee benefits                                            | Schmutz et al. (2017)                                                      |                                                                                                                                |
| Fairer sales contracts                                                 | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Shared resources (i.e., equipment)                                     | Galli and Brunori (2013),                                                  |                                                                                                                                |
| Increase in suppliers in the region                                    | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Fair prices                                                            |                                                                            |                                                                                                                                |
| Traceability product’s                                                 |                                                                            |                                                                                                                                |
| Set prices among farmers of the region                                 | Vitterso et al. (2019)                                                     |                                                                                                                                |
| A shift from employed to employer                                      | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Income constancy’s                                                     |                                                                            |                                                                                                                                |
| Change most suitable vehicle (reduction of transport-related costs)    | Schmutz et al. (2017)                                                      |                                                                                                                                |
| Reduction of competitors, including producers in the region            | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Shared profits among producers                                         | Selitto, Vial and Viegas (2018)                                            |                                                                                                                                |
| Rural tourism                                                          |                                                                            |                                                                                                                                |
| Reduction of food losses                                               | Enjolras and Aubert (2017)                                                 |                                                                                                                                |
| Reduction of intermediaries                                            | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020)                        |                                                                                                                                |
| Increased insertion in distribution channels                           |                                                                            |                                                                                                                                |
| Increase in employees in the region                                    | Schmutz et al. (2017)                                                      |                                                                                                                                |
| Increased voluntary work (solidarity)                                  |                                                                            |                                                                                                                                |
| Training carried out in conjunction with producers                     | Jarzębowski, Bourlakis and Bezat-Jarzębowska (2020); Schmutz et al. (2017) | WRS test (equating between quantitative variables before and after insertion in SFSCs)                                         |
| Employees pay increase                                                 |                                                                            |                                                                                                                                |
| Increased contracts with guaranteed sales                              |                                                                            |                                                                                                                                |
| Price increase applied                                                 |                                                                            |                                                                                                                                |
| Increased range of products sold                                       |                                                                            |                                                                                                                                |
| Reduction in trips (delivery to the customer)                          | Schmutz et al. (2017)                                                      |                                                                                                                                |
| Reduced mileage (delivery to the customer)                             |                                                                            |                                                                                                                                |
| Reduced mileage of vehicle without merchandise                         |                                                                            |                                                                                                                                |
| Reduction of mileage between suppliers and farmers (local initiatives) |                                                                            |                                                                                                                                |

Source: Authors' elaboration on studies of SFSCs and Economic Sustainability.

As for the characterization of the properties, it was shown that most (4) were bought by family members between the 50s and 70s, as shown in Table 2. This factor shows a family succession and a coffee tradition in the city and region studied (Garça Region, 2020).

Most (4) of the properties studied began operating in the SFSC in 2017, and in the same period, the farmers were encouraged by public power to improve their products and begin with specialty coffee production. Regarding the total area and productive capacity of the properties studied, they

refer to the total coffee production with conventional and specialty beans. Most farmers (3) present between 20 and 30% of their production in specialty beans. Most farmers (4) operate in commodity markets with sales of conventional beans, intending to gain scale. Therefore, it is essential to point out that not all coffee production is specialty coffee, where most of the production is conventional and directed to the commodity market, especially to cooperatives, who sell the products to the internal and external markets. The producers valorize the commodity market with their gain scale.

As for productivity, only research B stood out from the others and was the only one in which most of its production (80%) is geared to direct sales to consumers.

Regarding annual revenues, it has been shown that all cases above R\$200.000.00 can only be related to the area of production capacity. The fact that the number of sales channels is not considered an influential factor in this aspect can be explained by the higher percentage of sales focused on the commodity market. However, when comparing the value of selling a coffee bag (60 kg) between the commodity market and direct sales, there is a minimum increase in special coffee sales of 140% to the final consumer. Also, it is essential to mention that only a case (A) sells a part of his production (10%) of specialty coffee to toasters. The remainder of his sell and the other cases sell through SFSCs. The specialty coffee production to the SFSCs is absorbed by the local, regional and national markets. The products targeted to the local market are those sold through social media, on the property, own stores, and telephones. Some (A, B) engage sales in their stores or farm by serving the beverage ready to consumers when identifying possible future losses due to the product's expiration date, reducing losses. It is too a strategy that makes the customers take the products to serve themselves at home, thus increasing the farmer's sales and avoiding losses to the farmers. Sales to regions a little further away, such as  $\geq 400$  km, or national, including sales to other Brazilian states, are those that farmers use technological

ways for their sales, for example, online retail, on-site sales, e-mail, or go to special events to promote and sell their products, as specialty coffee fairs.

Regarding the number of sales channels, it was found that most (4) use social media, followed by traditional retail (3), online retail (2), own stores, on-site sales, telephone, e-mail, and sales at specialty coffee fairs (1).

With the inclusion of producers in SFSCs, the change in the coffee supply chain was noticed, in which some processes were vertically integrated, as shown in Figure 2.

All cases present a score of specialty coffee between 80 and 90, classified by S.C.A.'s, and that new way to produce requested changes internal in the farmer's propriety. When farmers began selling specialty coffees, they changed their internal processes from harvesting with superior grain selection and improving their quality products. In some cases, labor was hired for manual harvesting (A), machine adjustments (B), for example, machinery brake adjustments aiming when slowing down for selective harvesting, there was an investment in a shady hanging yard for natural drying (A, B, D, E). There were changes in storage bags, because in some cases (A; B; C; D), before the material was jute and the farmers invested in other bags with different materials, intending to store not only the product but its propriety sensory characteristics. There was the definition of specific fields (D) to harvest. Farmers also purchased machinery (such as a peeler (A); grain washer/dryer (B, E); dryers (B, E)) to improve the quality of the grains offered, whether for the commodity market or direct sales.

Other processes were implemented with the inclusion of farmers in SFSCs with the sale of specialty coffees, from roasting to after-sales services. Roasting and packaging processes that are not carried out on rural properties (C, D) are outsourced, and later the coffee is returned to farmers to be sold directly for consumption. Farmers also purchased machinery for the integration of internal processes by selling directly to consumers, including roasters (B, E), grinders (A, B, E), packaging sealers (A, E), and infrastructure installation (hanging yard (A, B, D, E)).

**Table 2:** Characterization of properties.

|   | Established Year | Begin SFSC | Area (ha) |      | (%)                    | Collaborators | Earnings (thousands R\$/year) | Sales channel (SFSC) of specialty coffees                                       |
|---|------------------|------------|-----------|------|------------------------|---------------|-------------------------------|---------------------------------------------------------------------------------|
|   |                  |            | Total     | Prod | Prod. Coffee Specialty |               |                               |                                                                                 |
| A | 1972             | 2017       | 19        | 15   | 30                     | up to 10      | up to 500                     | Traditional retail; social media; Sale on the property; Coffee fairs and events |
| B | 1995             | 2005       | 190       | 110  | 30                     | up to 10      | over 500                      | Online Retailer; social media; Own stores                                       |
| C | 1970             | 2017       | 50        | 40   | 5                      | up to 10      | over 500                      | Traditional and Online Retail; social media                                     |
| D | 1950             | 2017       | 43        | 40   | 20                     | up to 10      | over 500                      | Traditional retail                                                              |
| E | 1974             | 2017       | 24        | 14   | 10                     | up to 10      | up to 500                     | Social Media; Website, phone and email                                          |

Source: Author's data.

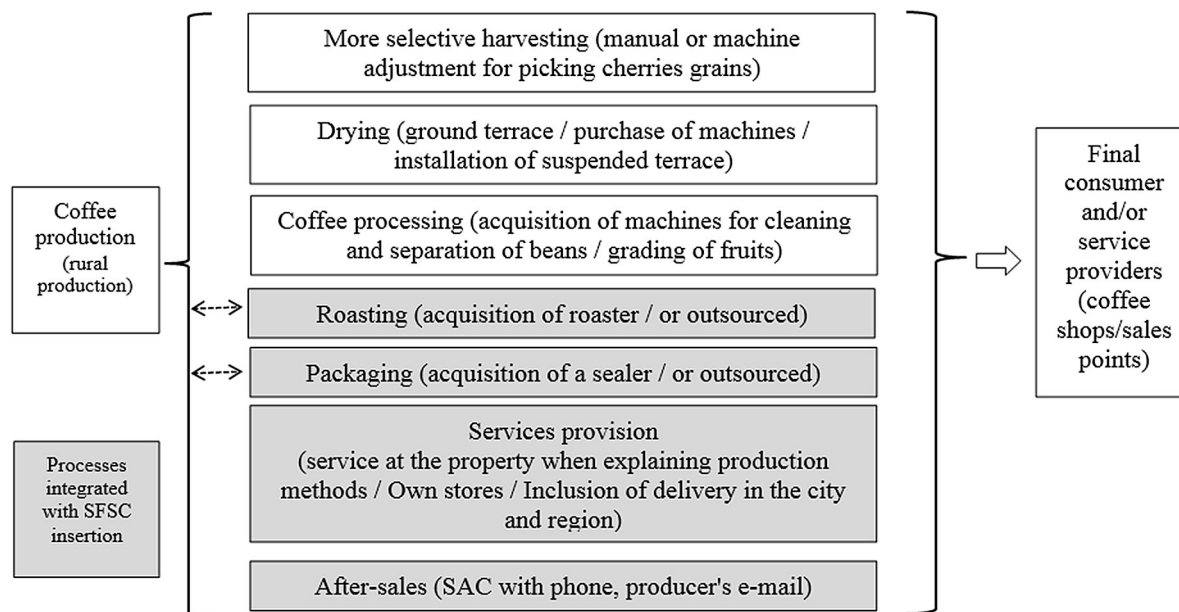


**Figure 2:** Coffee supply chain (S.C.), after the insertion of farmers in SFSCs.

Source: Authors' elaboration.

## 4.2 Economic Sustainability of Farmers, by Acting in SFSC

To “identify the changes in economic Sustainability that occurred after producers’ performance in SFSC,” the descriptive statistical analysis was applied based on respondent’s responses, as described in Figure 3.

According to respondents, small producers were included in new markets and local initiatives to promote farmers. One of the local initiatives is the specialty coffee competition promoted by the Specialty Coffee Association of Garça. This association aims to gather producers to improve their commercialization scale and produce a differentiated, high-quality coffee allowing certifications. One of its organizations acts together with public institutions and aims to promote and recognize the quality of the beverage in the municipality and region (Garça Region, 2020).

There was the increased profitability, access to new markets, autonomy of applied prices (A, C, D, E) and perception of fairer prices (A, B, C). In some cases, sales of specialty coffees through SFSCs also increased monthly profitability of 20% to 40% (B, C, D, E) and around 300% in others (A). However, it is noteworthy that the business focus of most farmers, except case B, is still the commodity market, aiming to gain scale.

The increase in benefits aimed at workers was identified in four cases (A, B, C, D). In all cases, there was a shared knowledge of the internal processes of the property aimed at improving the quality of the products offered, for example, the exchange of experiences and learning in connection with

roasting, which was until then not a necessary process before working in SFSC. In three cases (A, C, E), there was the exchange of physical resources between farmers. The main items mentioned were storage and roasting sites. However, most respondents (A, B, C, D) reported that the costs of using these infrastructures and their profits are not shared among them. Similarly, the majority (B, C, E) reported that sales prices of the products are not combined, and the majority (A, C, D, E) considered an increase in competition among farmers in the region. However, farmers share information and infrastructure, the majority (A, C, D, E).

Other factors indicated the absence of economic sustainability benefits generated by the inclusion of farmers in SFSCs, in which most responses showed no changes from employee to the employer (A, B, D), constancy in income (C, D, E), vehicle exchange, as an adequate transport for the delivery of products, a reduction in vehicle maintenance costs and CO<sup>2</sup> (B, C, D), integration between sectors such as rural tourism and a reduction in food losses (A, B, C, D, E).

About equating the economics’ sustainability variables of producers (before and after) of the action trough of SFSC, in addition to descriptive statistics, the W.R.S. test was applied, as shown in Table 3.

In order to support that the differences exposed by means of descriptive statistics are significant, the W.R.S. test was applied. By indicating that the p-value is less than (0.05), the null hypothesis is rejected, suggesting the difference between the pairs of economic sustainability variables of farmers after insertion into SFSCs.

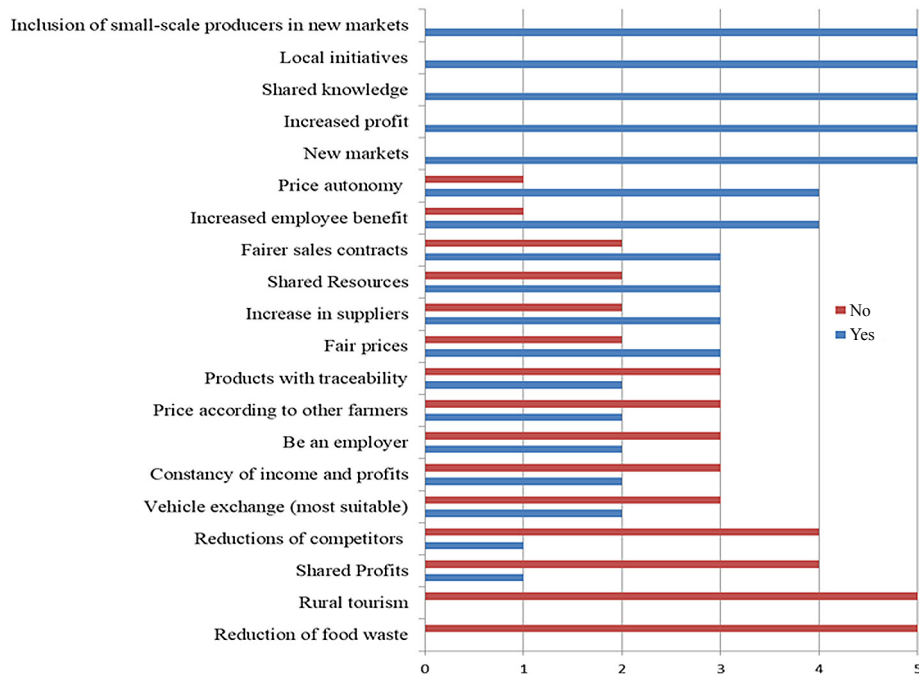


**Figure 3:** Changes in economic Sustainability after working in SFSC.

Source: Authors' elaboration.

**Table 3:** Equalization of economic sustainability variables (before and after) insertion in SFSCs

| Variables                                                                                | Unit Before<br>(addition) | Before<br>average | Unit after<br>(addition) | Average<br>after | Dif.<br>Average<br>(%) | p-value |
|------------------------------------------------------------------------------------------|---------------------------|-------------------|--------------------------|------------------|------------------------|---------|
| Number of intermediaries                                                                 | 17                        | 3.4               | 5                        | 1                | -0.71                  | 0.019   |
| Distribution channels used                                                               | 5                         | 1                 | 34                       | 6.8              | 600                    | 0.007   |
| Collaborators from the region                                                            | 19                        | 3.8               | 54                       | 10.8             | 184                    | 0.523   |
| Volunteers                                                                               | 0                         | 0                 | 4                        | 0.8              | -                      | 0.179   |
| Training/consulting in conjunction with other<br>Farmers                                 | 1                         | 0.2               | 27                       | 5.4              | 2600                   | 0.044   |
| Employees' salary (R\$)                                                                  | 8,300                     | 1,660             | 11,000                   | 2,200            | 33                     | 0.033   |
| Sales warranty agreements (a.a.)                                                         | 11                        | 2.2               | 26                       | 5.2              | 136                    | 0.503   |
| Price of the main product sold (R\$) - (coffee/bag – 60/kg)                              | 2,550                     | 510               | 8,200                    | 1,640            | 222                    | 0.011   |
| Variety of products sold                                                                 | 5                         | 1                 | 33                       | 6,6              | 560                    | 0.007   |
| Monthly trips made to deliver the product to the consumer                                | 3                         | 0.6               | 20                       | 4                | 567                    | 0.023   |
| Mileage for the delivery of products to the consumer                                     | 410                       | 82                | 1,390                    | 278              | 239                    | 0.054   |
| Mileage of the vehicle without goods for the delivery of the<br>products to the consumer | 410                       | 82                | 1,390                    | 278              | 239                    | 0.208   |
| Mileage of suppliers for delivery of products on the property                            | 1,130                     | 226               | 3,320                    | 664              | 194                    | 0.054   |

Source: Author's data.

It was observed that there was a difference in the number of intermediaries (0.019), the distribution channels used by farmers (0.007), training and/or consulting with other farmers (0.044), the value of employees' salaries (0.033), the price of the main product sold (0.011), the variety of products sold (0.007) and the number of monthly

trips made to deliver the product to the final consumer (0.023).

The main product's price showed a difference, with 222% of the increase in the average between before and after the SFSC. Similarly, employees began to get a better salary after the inclusion of farmers in SFSCs, and after adding value

to their products, as, according to one of the interviewees, the participation in coffee competitions, which resulted in scores and profits above expected, made them value their employees more.

It was possible to observe a difference in the variety of products sold, in which farmers began selling roasted coffee powder, beans (A, B, C, D, E), capsules (B), machines, and accessories for coffees (B) and the creation of gift baskets with grain products (B, C).

About the trips number to deliver the products, there was an increase of average among the surveyed. It passed from one trip to four per month. Before, producers only delivered the products to an intermediary, and the fact that the number of delivery trips increased showed the service to the final consumer. However, it increased the mileage (239% of the average) that affects its financial costs when delivering to locations far from their locations and reaching 600 km.

Regarding the other variables, there was no significant difference according to the W.R.S. statistic.

## 5 DISCUSSIONS

About the characterization of the properties, most of them started their activities in the SFSCs, in 2017, together with the specialty coffee production. This result could be related to the high production of Arabica coffee in the country in 2016. According to the CONAB (2020), national coffee production has been no more than 33 thousand processed bags since 2008, and in 2016, it produced more than 40 thousand bags. The same happened in the state of São Paulo. Since 2008, production has not exceeded 4 thousand bags, and in 2016, there was a production of more than 6 thousand bags. The increase in production and the competitors' numbers for the same product resulted in a reduction in the price offered (Mendes, 2004). This factor may be related to the initiatives of the coffee producers studied who work in SFSCs to add value to their final products in search of superior financial gains (Marescotti; Belletti, 2016). In the same period, there was also support from public authorities in conjunction with institutions to value the quality and origin of the product in the region (Centro do Comércio de Café do Estado de Minas Gerais - CCCMG, 2018). These factors may have contributed to the focus of farmers on the production of roasted coffees, resulting in specialty coffees and direct sales to consumers, seeking differentiation and economic gains (Marescotti; Belletti, 2016).

Regarding the number of sales channels, most searched use social media. The fact that farmers use social media as the main sales channel is linked to lower investment costs, but the use of these tools is considered strategic in approving and co-creating value in the channel through interactions with consumption and access to users "opinions about their products" (Negreti; Pigatto; Machado, 2020). Regarding

traditional retailers used for coffee sales, respondents classified themselves as sophisticated markets, as they do not display the products together with traditional coffees, which are in line with De Almeida and Zylbersztajn (2020), in which consumers in the coffee chain, with wide access to information and sales channels, in the search for quality and differentiation of the beverage.

Most of the sales channels used by farmers (about 70%) used the face-to-face types in SFSCs, such as sales on the farm, use of social media, sales at events, and others. Ilbery and Maye (2005) stated that sales made through face-to-face allow the interaction between producer and consumer. That action allows the farmer to explain to the customers the production processes of the grain and how the consumer can finalize the quality process of the product when will make the drink at home, for example, indicating the use of specific filters.

After the insertion in the SFSCs, the farmers purchased machinery for the integration of internal processes, including roasters, grinders, packaging sealers, and infrastructure installation. To Costa (2020) there is equipment in the coffee sector that contributes well to improving the process of quality of the drink. However, for Zylbersztajn, Giordano and De Vita (2020), although new machinery and/or new infrastructures contribute to farmers in terms of quality, some costs are generated by these investments, becoming a problem for the farmers. For this reason, some farmers have chosen to outsource the roasting and packaging processes of their products because although outsourcing still presents costs to farmers, these are still lower than the investments related to the acquisition of this machinery. Another factor is related to a market that farmers have entered recently, less than five years ago in SFSCs, presenting uncertainties about their permanence. Also, farmers showed more confidence in outsourced services when compared to internal processes, which would require experience and know-how skills to present beverage quality.

In this sense, vertical integration required skills, training, and learning in roasting, packaging, marketing, and after-sales aspects, following Carbone (2018), which quotes farmers in demand for operating costs, reorganization of their internal processes, and ability to deal with consumers.

With the reduction of intermediaries, farmers also began to provide directly to consumers, such as on-site services or coffee fairs and events (A), their stores (B), and social media (A, B, C, E), in explaining what production and origin methods were, creating transparency and social relationships, in according to Sellitto, Vial and Viegas (2018). Thus, in accordance to Lambert and Cooper (2000), Marescotti and Belletti (2016), Teixeira (2020), it was observed that farmers could integrate critical processes, from production processes to information and services, creating added value for consumers with information about products, processes, and beverage quality.

The producers also presented extended spatial proximity, according to Ilbery and Maya (2005), Sellitto, Vial and Viegas (2018). That reason is due to in all cases investigated the coffee brand itself was created to add value to the products. Farmers perceived the appreciation of origin by using the seal “Cafés da Região de Garça” on their packaging, which was collectively created between coffee growers and other institutions to assess the work of regional farmers and the origin of the products (Garça Region, 2020), in accordance with Ilbery and Maye (2005), Sellitto, Vial and Viegas (2018), when mentioning that there is an increase in cultural, traditional and social proximity between producer and consumer through the appreciation of the origin of products.

As for adding value to sustainable production modes, only cases A and B showed this characteristic through U.T.Z. certification, which aims to ensure responsible and sustainable production perceived by consumers (Pião et al., 2020; Teixeira, 2020). The U.T.Z. certification system allows coffee producers to demonstrate their activities responsibly under strict social and environmental standards (Valle et al., 2015).

For Pião et al. (2020), this certificate offers farmers an economic advantage, in which the improvement in the quality of production and processing enables a premium price of the product following the logic of supply and demand by imposing a higher price for a superior quality of the product offered. In the same line, to Coronado et al. (2015), the certification is essential in the supply chain in informing consumers, stakeholders, whom that cannot directly verify the attributes of products and processes, being a standardization strategy, allowing for increased food safety, with compliance to quality standards.

Concerning the quality of the specialty coffees among the cases studied, although there are similarities in the classification of their products and some productive changes (as the installation of a suspended terrace), it was noticed that those who present the U.T.Z. certification could differentiate themselves in this market, enabling competitive entry and permanence in spatially extended markets, being factors that contribute to the economic Sustainability of farmers. In spatially extended sales, consumers identify the production methods through certification seals, and this factor allows them to pay the price the farmers want (Ilbery; Maye, 2005; Marescotti; Belletti, 2016).

From this new shorter coffee supply chain, these results are in line with Sellitto, Vial and Viegas (2018) and Zylbersztajn, Giordano, and De Vita (2020) in those coffee growers have overcome one of the most complicated barriers in Brazilian agriculture, being the distance between them and final consumers. It was possible through the forms of direct marketing, allowing a cultural and social approximation. For Lambert and Matias (2017), this approach allows farmers to identify opportunities for consumer relationship management

in identifying structures that sustain these relationships over the long term, generating value and consumer loyalty through personalized services.

The producers, including small of them, were included in local initiatives of specialty coffee competition, promoted by the governmental institutions of Garça city. In this context, those actions can promote the qualities of product and region. Local government institutions are also looking for the Geographical Indication of the region's products. Those results follow Marescotti and Beletti (2016), Sellitto, Vial and Viegas (2018), citing that the inclusion of farmers in SFSCs is often associated with the search for product differentiation and local/regional appreciation.

The increased profitability, access to new markets, autonomy of applied prices, and perception of fairer prices are in line with authors as Galli and Brunori (2013), Jarzębowski, Bourlakis and Bezat- Jarzębowska (2020). They cited that the action in SFSCs promotes satisfactory market access, allowing farmers to present autonomy in the price of the product based on product quality, tradition, and origin, in a way that contributes to the economic viability of small and medium-sized enterprises in agricultural processing properties.

Concerning an increase in benefits for workers, in two cases it can be related to U.T.Z. certification. That certifier presents requirements related to labor issues, improvements in health, safety, and conditions of the working environment (Valle et al., 2015). In one of those cases, the house of the worker living on the property was renovated. It is a problem associated with the worker's quality of life and well-being, as one of the guarantees provided by the certificate.

Concerning integration between sectors, as rural tourism, these results are following Carbone (2018), and Sellitto, Vial and Viegas (2018), for them the products based on the value of origin share production's local, and they are benefited from an improvement of the perception of quality and reputation, being a double effect: the product can gain reputation if the region is famous and the region can be known when the products create recognition. Thus both (region or product) may generate new value associated with the product, such as creating tourist attractions inside coffee farmers, sharing the production's local, and the region can be knowledge.

Regarding the results of some variables of economic's Sustainability of producers (before and after) of the action trough of SFSC are in line with Galli and Brunori (2013), Jarzębowski, Bourlakis and Bezat- Jarzębowska (2020) demonstrating a difference in the means in relation to the studied variables, observed in descriptive statistics, suggesting that there were some changes in economic Sustainability after farmers were inserted into SFSCs.

The difference in intermediaries indicated a reduction in intermediaries between producers and consumers, allowing

## 6 CONCLUSIONS

farmers a higher profit margin, in agreement with studies of Sage (2003), and Sellitto, Vial and Viegas (2018). As for distribution channels, the surveyed have indicated an increase in opportunities for farmers to market their products through various sales channels, for example, by using technology in online sales, as pointed out by (United Nations Industrial Development Organization – UNIDO, 2020).

The same occurred through the increase in the diversity of products and services. This result is in line with Costa (2020), Enjolras and Aubert (2018), for them, the sales of the coffee accessories, as certain filters and grinders are due to consumers of specialty coffees to perform procedures at home in the search for the best extraction of the drink and pleasant experiences.

Between before and after the SFSC, was possible to identify an increase in the average of the main product's price. The 60 kg coffee bag, which was previously only intended for the commodity market, was later sold through the SFSC, adding value to the product, resulting in a special coffee being sold directly, and creating economic gains for farmers, as Jarzębowski, Bourlakis and Bezat- Jarzębowska (2020), Marescotti and Beletti (2016) have shown.

In the same way, employees began to get a better salary after the inclusion of farmers in SFSCs, and after adding value to their products. That result is in line with Schmutz et al. (2017), in which one of the economic sustainability benefits of SFSCs is to improve the quality of products and local jobs.

About the trips number to deliver the products, there was an increase of average among the surveyed. It passed from one trip to four per month. Before, producers only delivered the products to an intermediary, and the fact that the number of delivery trips increased showed the service to the final consumer. However, it increased the mileage (239% of the average) that affects its financial costs when delivering to locations far from their locations and reaching 600 km. This research did not identify coordination among farmers in sharing logistical resources or organizational planning to reduce transport costs, including better capacity utilization, by not traveling with the vehicle without goods (Enjolras; Aubert, 2018; Schmutz et al., 2017).

Concerning the other variables, they have not presented a significant difference in Economic Sustainability, through the statistic test. It is important to mention the suppliers in which there was no difference in mileage, which indicates that the location of the supplies remains the same. Although the number of suppliers has increased in three cases, most of them are in other Brazilian regions, with more than 500 km from where the farmers are. This result is not in line with Jarzębowski, Bourlakis and Bezat- Jarzębowska (2020), considering that inclusion in the SFSC indirectly contributes to the region's economic Sustainability by purchasing goods and services from local suppliers.

All the cases studied began their operations in SFSCs and specialty coffee in 2017. The primary market of that producers is conventional, with scale gain. Specialty coffee is only a part of farmers' production, being sold through SFSCs in local, regional, and national markets. The main sales channel is social medial, allowing interactions between farmers and customers. With the beginning of specialty coffee, there were changes in internal processes, allowing the farmers to present a specialty coffee, but the U.T.Z. certification was a differential point to Sustainability economics for farmers. With the inclusion of farmers in SFSCs, other processes were implemented, from roasting to after-sales services to selling specialty coffee, demanding some skills, such as communication with the customers.

With the inclusion of farmers in SFSCs and adding value to the products, selling specialty coffees enabled some economic sustainability benefits, such as the entry of small farmers into new markets, the autonomy of prices, increased monthly profitability, more number of sales channels, and ways of exposing their products, with values associated with its origin. The economic Sustainability of the farmers has also impacted the employees in a positive way, where it was possible to observe an increase in benefits and salary values.

However, there were costs related to new machinery infrastructures, by integrating vertical processes, being economic adversity to be overcome by farmers. Other possibilities for economic improvements include integrating sectors, such as offering tourism-related activities in the coffee chain and contributing to regional development.

It was not possible to identify collaboration among farmers located in the region studied, in collaborating in order to reduce operational costs, logistical sharing, among other aspects, and this lack of coordination can cause high competition located in the same city and region.

With the shortening of the chain, coffee farmers have overcome one of the most complicated barriers in Brazilian agriculture, the distance between farmer and final consumer, through direct marketing or cultural and social approximation. Through this approach, farmers can identify opportunities for managing the relationship with the consumer by being structured based on how these relationships are developed and maintained, creating value over time, resulting in increased consumer loyalty and personalized services.

This research showed that the inclusion of farmers in SFSCs presents value addition to products, it can positively affect some economic sustainability variables. On the other hand, the inclusion in SFSCs presented costs for integrating vertical processes, which were economic difficulties overcome by farmers. Therefore, these factors can be resolved by sharing resources to reduce operating costs. As a research limitation,

the study did not focus on understanding farmers' "actions concerning consumer relationship management due to the proximity between producer and consumer." In future studies, it is proposed to investigate the economic Sustainability of SFSCs in other cultures, sectors, and/or regions, and an understanding of relationship management with consumption in short chains.

That paper presents social implications for the coffee farmers who wish to add value in their products, selling specialty coffee directly to customers, and the internal changes in the companies in order to meet the needs of customers. That way, this research seeks to contribute practically with coffee growers, extension workers, or public managers when they understand some changes in the internal processes with the insertion in SFSC and wish to contribute with the coffee farmers.

## 7 AUTHOR'S CONTRIBUTION

ASNC wrote the manuscript, with conceptualization; methodology; used the software; formal analysis; review, and reediting. EGS co-wrote the paper, reached the funding acquisition; guided the research; formal analysis, review, and editing. PABML and SSB Jr co-wrote the paper, guiding the research, review, and editing.

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